

What Is Claimed Is:

1. Apparatus for extracting bone material from an extraction site, comprising:
a housing defining a cavity and a passageway for transporting bone material to
a collection device, the passageway having a distal end, in communication with a first
5 end of a suction tube, and a proximal end;
a shaft disposed in the cavity;
an abrading head attached to a first end of the shaft;
a conduit extending through the shaft and abrading head, the conduit fluidly
communicating with the passageway; and
10 an actuator for actuating the shaft and abrading head;
wherein bone material is extracted through the conduit to the collection
device.
2. The apparatus of claim 1, in which the abrading head comprises a bur and
the actuator rotates the shaft.
- 15 3. The apparatus of claim 1, in which a second end of the suction tube is
connected to a vacuum source.
4. The apparatus of claim 1, in which the collection device comprises a
container in fluid communication with the suction tube.
- 20 5. The apparatus of claim 1, in which the housing defines a second
passageway for passing irrigation fluid to the extraction site, the apparatus further
comprising a source of irrigation fluid in fluid communication with the second
passage.

6. Apparatus for extracting bone material from an extraction site, comprising:
a housing defining a cavity and a passageway for transporting bone material to
a collection device, the passageway having a distal end, in communication with a first
end of a suction tube, and a proximal end;

- 5 a drive member disposed in the housing adapted for connection to an actuator;
 a shaft disposed in the housing cavity having a first end releasably connected
to the drive member and a second end; and
 an abrading head attached to the second end of the shaft.

- 10 7. The apparatus of claim 6, in which the drive member comprises a rotating
shaft and the abrading head comprises a bur.

8. The apparatus of claim 6, in which a second end of the suction tube is
connected to a vacuum source.

9. The apparatus of claim 6, in which the collection device comprises a
container in fluid communication with the suction tube.

- 15 10. The apparatus of claim 6, in which the housing defines a second
passageway for passing irrigation fluid to the extraction site, the apparatus further
comprising a source of irrigation fluid in fluid communication with the second
passage.

11. Apparatus for extracting bone material from an extraction site,
comprising:

- 5 a housing defining a cavity and a passageway for transporting bone material to
a collection device, the passageway having a distal end, in communication with a first
end of a suction tube, and a proximal end;
- a flexible shaft disposed in the cavity;
- an abrading head attached to a first end of the shaft; and
- an actuator coupled to a second end of the shaft.

10 12. The apparatus of claim 11, in which the flexible shaft comprises a tightly
wound spring.

 13. The apparatus of claim 11, in which the flexible shaft is prestressed to
bend in a predetermined direction.

 14. The apparatus of claim 11, in which the abrading head comprises a bur
and the actuator rotates the shaft.

15 15. The apparatus of claim 11, in which a conduit extends through the
abrading head and shaft to fluidly communicate with the passageway proximal end.

 16. The apparatus of claim 11, in which a drive member is disposed in the
housing and is adapted for connection to the actuator, and the shaft second end is
releasably connected to the drive member.

17. A method for extracting and collecting bone material from a bone, the method comprising:

boring a hole in the bone to a depth sufficient to form a bone material extraction site;

5 extracting the bone material from the bone material extraction site; and
collecting and storing the bone material in a collection chamber.

18. The method of claim 17, further comprising aspirating liquid bone material from the bone material site.

10 19. The method of claim 17, in which the bone material, prior to the
extracting step, is solid.

20. The method of claim 17, further comprising infusing a solution into a void in the bone resulting from the bone material extracting step.

21. The method of claim 20, in which the solution is selected from the group consisting of anticoagulant containing saline solution and electrolyte solution.

15 22. The method of claim 19, further comprising:
mixing the bone material with a liquid to form a mixture;
transferring the mixture to the collection chamber; and
isolating the bone material from the mixture to form isolated bone material.

20 23. The method of claim 22, further comprising:
preserving the isolated bone material with a preservative to form preserved
bone material; and
storing the preserved bone material.

24. The method of claim 17, in which an abrading head attached to a shaft is used during the boring step.

25. The method of claim 24, in which the bone material passes through a conduit formed in the abrading head and shaft during the extracting step.

5 26. The method of claim 24, in which the shaft is flexible to increase a radial coverage range of the abrading head.

Patent Application No. 10/000,000

27. A shield for use with a bone material extracting apparatus having a housing and an abrading head, the apparatus extracting bone material from an entry port formed at a bone material extraction site, the shield comprising:

5 a hollow body having a connection end, a receiving end, and a neck portion disposed between the connection end and receiving end, the receiving end defining an opening sized to receive at least a part of the extracting apparatus housing;

a collar attached to the connection end and sized for insertion into the entry port; and

10 a gasket positioned in the neck portion and having an inside diameter sized to closely fit an exterior surface of the extracting apparatus housing.

28. The shield of 27, further comprising an arm having a grip end positioned near the body receiving end and a directing tip positioned near the body connection end.

15 29. The shield of 28, in which the arm is moveable about an interior surface of the hollow body, thereby to adjust the position of the directing tip.

30. The shield of 27, in which the hollow body is formed of a transparent silicone.

31. The shield of 27, in which the collar is releasably connected to the entry port.

20 32. The shield of 27, in which the collar is formed of collagen.

33. A bone implant for use during bone material extraction by an extraction device having an abrading head, the bone material being extracted from an entry port formed at an extraction site, the bone implant comprising:

5 a collar having an outer surface sized for insertion into the entry port and defining an inner aperture sized to receive at least the abrading head of the extraction device; and

a removable cap sized to close off the inner aperture.

34. The bone implant of claim 33, further comprising means for releasably connecting the collar to the entry port.

10 35. The bone implant of claim 34, in which the collar is shaped as an annular ring.

36. The bone implant of claim 35, in which an internal thread is formed in the entry port, and in which the releasable connecting means comprises a complementary external thread in an exterior surface of the collar.

15 37. The bone implant of claim 33, in which the collar is adapted for releasable connection to a shield.